



EC-Tech Chronicle

2020-21

Department of Electronics and Communication Engineering



PRAGATI ENGINEERING COLLEGE (AUTONOMOUS)

Approved by AICTE, New Delhi & Permanently Affiliated to JNTUK, Kakinada & Accredited by NAAC with 'A' Grade



Vision of the Department

To be an acknowledged Leader in providing quality education, training and research in area of Electronics and Communication Engineering to meet the industrial and Societal needs.

Mission of the Department

M1	To facilitate students with a state-of-the-art infrastructure, learning environment and value-based education to improve technical knowledge and skills for continuous learning process.
M2	To impart high quality education with well qualified faculty and enable students to meet the challenges of the industry at global level
M3	To promote innovation and active industry institute interaction by facilitating the students to improve their leadership and entrepreneurship skills with ethical values.

Program Educational Objectives (PEOs)

PEO 1	To prepare Graduates with sound foundation in fundamentals of mathematics, science and engineering to assist them exhibit strong, independent learning, analytical & problem solving skills in Electronics and Communication Engineering domain.
PEO 2	To facilitate learning in the core field with effective use of modern equipment and programming tools to solve real life, multi-disciplinary problems with professional, ethical attitude and also to make them aware of their social responsibilities.
PEO 3	To assist and enable individuals to imbibe lifelong learning in thrust areas related to research & innovation to have Progressive Careers or Entrepreneurs.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO-1	The ability to apply concepts in electronics and communication engineering, to design and implement complex systems in the areas related to analog and digital electronics, communication, signal processing, VLSI & ES.
PSO-2	Ability to provide discerning solutions based on their expertise in electronics and communication courses in competitive examinations for successful employment, higher studies and research.



PROGRAM OUTCOMES (POs)

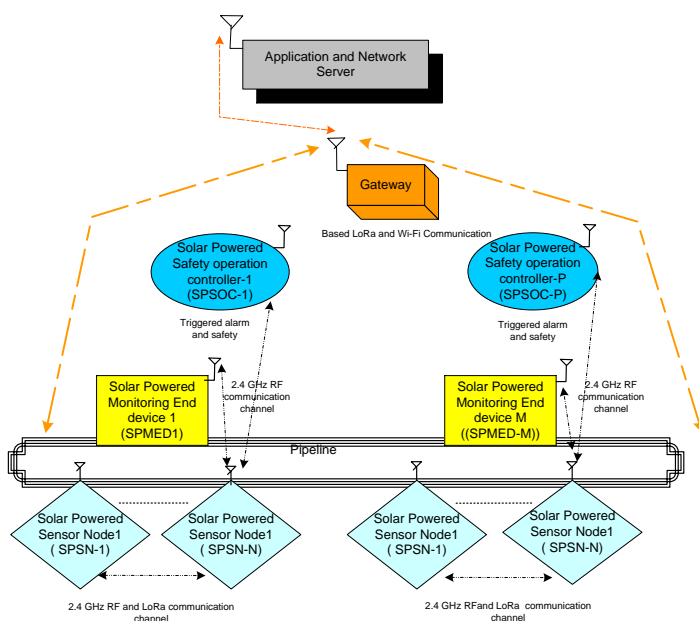
1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.



Pipeline Monitoring Using IoT

Objective

In this Article, we reviewed and proposed the energy harvesting types for end sensor nodes for pipeline monitoring in remote areas.



Procedure

The architecture from figure 4 shows solar-powered sensor nodes to collect data from pipeline parameters like Corrosion, Gauge pressure, Temperature of oil, Leaks, etc. The above architecture consists of the monitoring section, a communication protocol for transmitting data, safety operation controller and Application server via LoRa gateway to store information. In the monitoring section, critical parameters of the pipeline should be measured. Various smart wireless sensors with solar energy harvesters are used to monitor critical parameters that give long lifetime for sensor nodes that are remotely placed. The monitoring Section of the pipeline with solar energy has different categories like hardware-based, Software-based and conventional methods used in pipeline leakage detection and comparison of advantages and limitations of methods are reviewed. Especially hardware vibration detection method using the accelerometer sensor is focused. The energy received from the solar panel is stored in batteries and it is a centralized battery that power supply given to all communication devices. The gathered information is sent to 2.4 GHz RF controller board and LoRa controller board via microcontroller which will perform some computations. Now the data will be communicated to Servers via LoRa gateway.

Conclusion

We proposed an energy harvesting system for pipeline monitoring in remote areas.

AVUGANTI VENKATA KALYANI

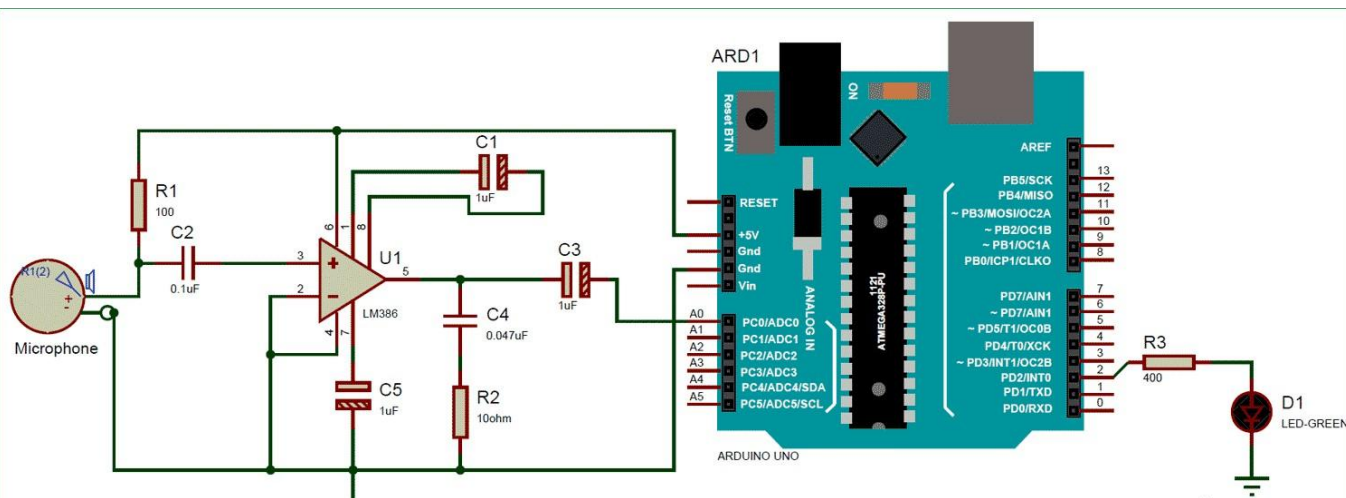
18A35A0424



Measuring Sound Arduino

Objective: Noise pollution has really started to gain importance due to high population density. A normal human ear could hear sound levels from 0dB to 140dB in which sound levels from 120dB to 140dB are considered to be noise. Loudness or sound levels are commonly measured in decibel(dB), we have some instruments which could measure the sound signals in dB but these meters are slightly expensive and sadly we do not have an out of box sensor module to measure sound levels in decibels. And it is not economical to purchase expensive microphones for a small Arduino project which should measure the sound level in a small classroom or living room.

Description: So in this project we will use a normal Electric Condenser microphone with Arduino and try measuring the sound or noise pollution level in dB as close as possible to the actual value. We will use a normal amplifier circuit to amplify the sound signals and feed it to Arduino in which we will use regression method to calculate the sound signals in dB. To check if the values obtained are correct we can use the “Sound Meter” android application, if you have a better meter you can use that for calibration. Do note that this project does not aim to measure dB accurately and will just give values as close as possible to the actual value.



Mr.Ch.Venkateswarlu

Asst.Professor

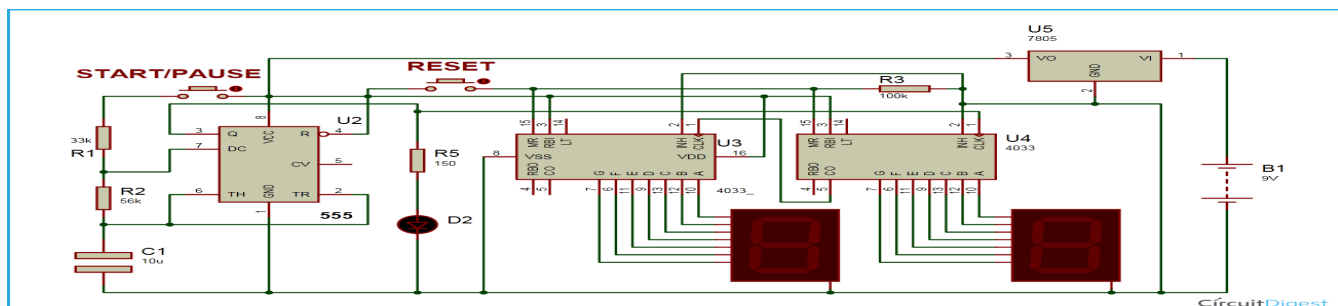
Dept of ECE



Digital watch

Objective

Often we need stopwatch to count the time taken by a person to complete the event and also to differentiate the time of two events. Now our ultimate aim is to design a stopwatch using digital components like 555 timer IC, resistors, capacitor, IC 4033, push buttons, common cathode seven segment displays, battery connector, bread board, LED and voltage.

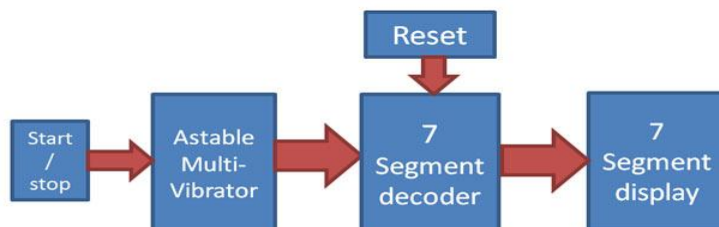


Working

In this stop watch circuit we have generated one second delay by using 555 timer based astable multivibrator. By using some calculation we can easily generate one second delay. In an astable multivibrator, there are two resistors and one capacitor responsible for the delay by charging or discharging the capacitor through the resistors. The calculation formula for generating delay for an astable multivibrator is given below.

$$F = 1/T = 1.44 / (R1 + 2R2) C1$$

In this methodology, we have selected R1 as 33K, R2 as 56K, and C1 as 10uF. The astable multivibrator generates a one-second delay, which is an oscillation or pulse of 0 and 1. So we will use this pulse to trigger the seven-segment decoder, which then changes the digit number with the one-second time period.



SOMANA ANIKA ANGEL

17A31A0421



2.4Ghz Technology

Today's the developing world shows various adventures in every field. In each field the small requirements are very essential to develop big calculations. By using different sources we can modify it as our requirements and implement in various field. In earlier days the measurements are generally occur through measuring devices. But now a day's digitalization as is on height. Therefore we use a proper display unit for measurement of distance. We can use sources such as sound waves which are known as ultrasonic waves using ultrasonic sensors and convert this sound wave for the measurement of various units such as distance, speed. This technique of distance measurement using ultrasonic in air includes continuous pulse echo method, a burst of pulse is sent for transmission medium and is reflected by an object kept at specific distance. The time taken for the sound wave to propogate from transmitter to receiver is proportional to the distance of the object.

Distance measurement using ultrasonic sensor of a transmitter part of ultrasonic module units ultrasonic high frequency waves in the form of polices after collision of these wares with any object, these wares detected by microphone time taken by these wares from transmitter and receiver is used to measure distance from any object. We had used a ultrasonic sensor module of HC-SR04, because this ultrasonic module is initiated with pulse of 10us.since the population has been increasing day by day the roads have been flooded with the vehicular traffic this is the reason to make vehicle intelligent by introducing Pothole detection.